PLEASE EXPEDITE IN GAU 2814
AMENDMENT AFTER FINAL

Atty. Dkt. G-31

#11 (Cont'd)
4/12/01
V. Vannucci

Do not enter
4/13/01

Payton
6-22-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Michel LEDUC, Philippe MARTIN, and Richard KALINOWSKI
Serial No.	:	09/101,049
Confrm. No.	:	9220
Filing Date	:	June 26, 1998
GAU	:	2814
Examiner	:	Mr. D. Graybill
For	:	Contactless Electronic Module For A Card Or Label

AMENDMENT B - AFTER FINAL

This is in response to the January 16, 2001 Office Action FINAL (Paper No. 10).

Please amend:

IN THE CLAIMS:

Claims 1 - 26. Cancel.

Add the following new claims 27 - 46.

Sub C1

Claim 27. An electronic label comprising an electronic module having a substrate (10) with a major plane surface; a spiral antenna (2) mounted on said substrate and having a plurality of turns parallel to the major plane surface, and having an outer size in the region of 5 to 15mm; and an electronic micro circuit (7) connected to said antenna.

C' cont'

B1

Claim 28. An electronic label comprising an electronic module having a substrate (10) with a major plane surface; an antenna (2) mounted on top of said substrate and having a plurality of turns parallel to the substrate major plane surface; an electronic micro circuit (7) insulatively mounted on top of and electrically connected to said antenna.

; said electrically connected antenna and microcircuit comprising connection terminals (11,12) of the antenna and contact pads (13,14) of the electronic microcircuit (7) connected via leads (15).

C' Concld

Claim 29. Electronic label comprising an electronic module (6) having a substrate (10) with a major plane surface, an antenna (2) and an electronic microcircuit (7), said microcircuit (7) being connected to the antenna (2) to enable contactless operation of the module (6), the whole of the antenna (2) being arranged on the substrate and comprising turns made in the plane of the substrate (1), said microcircuit antenna connection including said antenna having connection terminals (11,12) being electrically connected to corresponding, respective contact pads (13,14) of the microcircuit, a tuning capacitor (17) being connected in parallel to the terminals (11,12) of the antenna to the contact pads (13,14) of the electronic microcircuit (7), the value of the capacitor (17) being chosen to obtain an operating frequency for module (6) in the range of approximately 1 Mhz to 450 Mhz.

Claim 30. A process for manufacture of an electronic label comprising the steps of manufacturing an integrated circuit chip card of ISO 7810 standard mechanical dimensions, and with a contactless connection, including an antenna in the range of 5 to 15mm, and with a microcircuit adjacent to and electrically connected to said antenna, and with said antenna and microcircuit being mounted in a well in said card;

cutting out a first section of the card containing the antenna and microcircuit, said cut-out section being slightly larger than the antenna;

cutting out a second section of same size as the first section from another portion of the card;

attaching the two cut-out portions together in a sandwich with their side edges aligned and with the well facing inward.

B1

Claim 31. A process for the manufacture of an electronic label comprising the steps of depositing on a continuous strip, a plurality of spiral antennae, the outer dimensions of the antennae being in the range of 5 to 15mm, depositing an insulating layer over the antenna, depositing microcircuits each having at least two terminals on top of the layer with each microcircuit over a different one of the antennas, connecting the terminals of the microcircuit to the underlying antenna, and separating from the strip the label that comprises a portion of said substrate with one of said antennas and the microcircuit and connections thereon.

Claim 32. Electronic label in accordance with claim 27, characterized in that the largest measurement of the electronic module (6) is in the region of 5 to 15mm, respectively, when said antenna having an outer size respectively in the region of 5 to 15mm.

Claim 33. Electronic label in accordance with claim 27, wherein the antenna (2) has an outer size in the region of 12mm.

B1

Claim 34. Electronic label in accordance with claim 27, wherein the antenna (2) spiral comprises between approximately 6 and approximately 50 turns, the width of each turn being of about 50 to 300 μm, and the space between two contiguous turns being in the region of 50 to 200 μm.

Claim 35. Electronic label in accordance with claim 27, wherein the outer shape of said spiral is selected from the group consisting of substantially circular, substantially square, and substantially oval.

Claim 36. Electronic label in accordance with claim 27, wherein the microcircuit (7) is placed on the same side as and astride the antenna (2).

Claim 37. Label according to claim 28, wherein said microcircuit is smaller than said antenna and is mounted thereon completely within boundaries of said antenna.

Claim 38. Label according to claim 28, wherein said substrate has its largest dimension in said major plane in the region of 5 to 15mm, and the largest dimensions of the antenna, and microcircuit parallel to said plane are smaller than said substrate.

B1

Claim 39. Electronic label in accordance with claim 28, wherein the antenna is a spiral whose outer size is in the region of 5 to 15mm, having between approximately 6 and approximately 50 turns, the width of each turn being of about 50 to 300 μm, and the space between two contiguous turns being in the region of 50 to 200 μm.

Claim 40. Electronic label in accordance with claim 39, wherein the outer shape of said spiral is selected from the group consisting of substantially circular, substantially square, and substantially oval.

Claim 41. Electronic label in accordance with claim 28, wherein the microcircuit (7) is located on top of a central portion of the antenna (2).

Claim 42. Electronic label in accordance with claim 29, wherein the value of tuning capacitor (17) is in the region of 12 to 180 picoFarad, and the operating frequency of the module is approximately 13.56 Mhz.

Claim 43. Electronic label in accordance with claim 29, wherein the value of turning capacitor (17) is in the region of 30 to 500 picoFarad, and the operating frequency of the module is approximately 8.2 Mhz.

B1

Claim 44. Electronic label in accordance with claim 29, wherein the tuning capacitor (17) is obtained by depositing oxidized silicon on the surface of the microcircuit (7) previously coated with an insulator (16).

Claim 45. Electronic label in accordance with claim 29, wherein the substrate has its largest measurement in the region of 5 to 15mm, and said antenna, microcircuit, and capacitor, all fit on top of said substrate within said dimensions in the region of 5 to 15mm.

B1

Claim 46. Electronic label according to claim 45, wherein said antenna has an outer size in the region of 12mm and said antenna has a spiral shape comprising between approximately 6 and approximately 50 turns, the width of each turn being about 50 to 300 μm, and the space between two contiguous turns being in the region of 50 to 200 μm; and said microcircuit being mounted on top of said antenna.

Claim 47. Proscess according to claim 30, wherein said antenna is a spiral whose outer size is in the region of 5 to 15mm, having between approximately 6 and approximately 50 turns, the width of each turn being of about 50 to 300 μm, and the space between two contiguous turns being in the region of 50 to 200 μm.

B1

Claim 48. Proscess according to claim 31, wherein said antenna is a spiral having between approximately 6 and approximately 50 turns, the width of each turn being of about 50 to 300 μm, and the space between two contiguous turns being in the region of 50 to 200 μm.

Concl'd

add C2

REMARKS

This is an amendment after FINAL. It is respectfully requested that the FINAL be withdrawn and the claims submitted herein be considered on the merits. The FINAL Office Action is a second Action. The previous amendment, Amendment A, presented substantially no new issues from what was originally filed. In the outstanding Office Action FINAL, the rejection is based entirely, on newly-cited and newly-applied references. None of the previous references are applied in the present rejection. Because the applicants in the previous amendment did not substantially change the focus or scope of the claims, applicants should now have an opportunity to amend those claims and submit reasons for their allowance.

There is a further reason for the Office to presently consider the herein newly-submitted claims. They do not substantially present new issues. Most of the issues in these claims are taken from dependent claims and focus on aspects of the invention which were previously before the Office. Thus, if the Office will not consider withdrawal of the Office Action FINAL, it should consider on the merits the claims as presently resubmitted herein.

To expedite examination, it is appreciated that the method claims, previously on file and as resubmitted herein, have not been perhaps fully focused on. If the Office

wishes to place a restriction requirement, between the device and method claims, then applicants will elect for further prosecution the device claims.

In the present amendment there are five independent claims. Previously, there were also five independent claims. The new claims are three device claims, 27, 28, and 29, and two process claims, 30 and 31.

An aspect of device claim 27 is the size of the device and its antenna. An aspect of device claim 28 is the relative location of the microchip on top the antenna. An aspect of independent claim 29 is the tuning capacitor feature. Dependent claims -46 amplify upon features and combine them together so that some of the dependent claims include all three aspects.

Let us first look at the question of size. As pointed out in the introduction of the specification, one object is small size coupled with good operating efficiency. Additional important features are ease, simplicity, and cost of manufacture. The device of the present invention may be produced in the millions per shift, and when the cost is sufficiently low, it is anticipated the device will be used by the millions in many of different objects. The emphasis on ease of manufacture, efficiency, reduced cost, and efficient and effective operation is essential. It is

believed that applicants' invention achieves these several goals.

Claim 27 is directed to the size of the device and its antenna, and defines particularly its largest dimension. As pointed out in one of the dependent claims, it is preferably 12mm, while in the independent claim it is in the range of 5mm to 15mm. As pointed out in the present Office letter, on page 7, the applied reference Iwasaki, new Ref. A, ". . . does not appear to explicitly teach the particular claim's space dimensions" [Office letter page 7, ¶5]. Iwasaki, moreover, teaches away from applicant's dimensions. Iwasaki's IC chip is about 10mm, and the antenna loop surrounds the chip. The substrate (1) is taught to be about 30mm on each side [column 3, line 12]. As taught in applicants' specification, the antenna is usually made as large as possible so as to increase the coupling. Why in Iwasaki would one take a 30x30mm substrate and then crowed the antenna on the center occupying less than one-quarter of the available space on the substrate? Applicants' maximum area = 15x15 = 225mm, while Ref. A's maximum area = 30x30, 900; 225/900 = .25%. In other words, prior art would place the antenna to get the largest cross area (diameter) of the loop, and therefore the outer turns would be closer to the outer edge, e.g., 29mm, 28mm for the outer size. This is what Iwasaki's drawing shows. In summary, Iwasaki, Ref. A,

does not explicitly teach applicants' particular claim's space dimensions, but the examples in Iwasaki, and knowledge of the man skilled in the art would make Iwasaki's dimensions larger, e.g., on the order of close to 30mm. This is more than four times the size of what is applicants' teaching and almost more than five times of applicants' preferred embodiment (12mm x 12mm = 144mm^2 vs. 30mm x 30mm = 900mm^2; and 144/900 = 0.16) as defined in applicants' dependent claims.

Further, all of the references appear to have difficulties with their antennae, and some have used multiple antennae, stacked antennas, or large antennae. This is a further teaching away from applicants' accomplishment of a smaller, yet significant advantage, antenna.

Independent claim 28 includes a feature of the chip being mounted on top of the spiral. The embodiments of this are shown in applicants' fig. 4(d), 4(e), 5(b) and in original claim 8. One of the advantages here is that of reduced size and also a compact structure; classical objectives which the art has over a long period of time been constantly seeking to achieve. The prior art does not show applicants' structure. The Office letter at page 9, beginning with the third paragraph, rejects previous claim 8 that contains an aspect of this feature on new reference

Hayashi, new Ref. O. This reference is in Japanese, but we have available the pictures and the English abstract. The Office letter cites figs. 7A and 7B. First, the element 94(b) appears to be the substrate. There is a double substrate here, 94(a) and 94(b). 94(b) appears to be the equivalent of the substrate 34 in fig. 4(a) on the same page. Thus, the microcircuit is not "astride" the turns of the antenna as taught in applicants' invention, but appears in the reference, to be on opposite sides of and separated by the substrate or the equivalent of a substrate. Contrary to what is asserted in the Office letter, 94(b) is not the equivalent of applicants' insulating layer. In the reference, what in Fig. 7B is layer 96? It is submitted that layer 94(b) is the substrate or a second substrate and, thus, the antenna 92(c) is separate from the micro chip (100) by the substrate 94(b). Perhaps more important is that the teaching of this Japanese reference is to solve two problems in a very elaborate way with complex structure that applicants' achieve with a simple structure. In the reference, Fig. 7B is a three-antenna structure with two-substrates. Obviously, it is not achieving the desired coupling efficiency that could be gotten with the single antenna of applicants' invention. Second, according to the Japanese patent abstract, last line, the structure is to "protect against bending forces that might attack the

antenna." That may explain the reason -- mechanical rigidity -- for the Japanese additional structure. In summary, the reference has three antennae and one of them is on multiple opposite sides of substrate/substrates. This is not what is in applicants' independent claim 28.

None of the other references show a single antenna with a chip mounted on astride the antenna on the same side of the substrate. As noted, applicants' new structure has simplicity, reduced size, and good coupling, all desirable and sought after objectives with a different structure than in the references.

Independent claim 29 is directed to the tuning capacitors.

Tuning capacitors are old, but applicants' particular structure of a tuning capacitor in its device and its particular relationship in the device, is not taught in the prior art. The references alone and in combination, it is respectfully submitted, do not show or reasonably suggest applicants' independent claim 29, nor its dependent claims.

The claims 32 - 46 are dependent from the three independent device claims and set forth various structural features and also combine some of the aspects so that in dependent claims there are multiple points of novelty and unobviousness. Consideration of the three independent claims and the full set of dependent claims is solicited,

and for the reasons set forth above, and in the absence of more pertinent art, it is submitted that these claims are allowable.

The two independent method claims are directed to features of the invention. Claim 30 is a process for efficiently and expeditiously manufacturing the device. This particular sequence of steps and the achieved goal is direct, simple, concise and believed to be indeed thrifty so as to permit very large production and very widespread use of such devices due to their resulting low cost. It is respectfully submitted that none of the references show this particular sequence.

Independent claim 31 has as a feature to employ a contactless ISO standard integrated circuit chip card, punch out the portion of the card with the contactless guts, i.e., electronics and antenna, from the remainder of the card and also from the same card punch out a slug of the same size and then glue the two portions together to form a sandwich. This is about 1.6mm high and probably about 1.6cm in diameter (if round shaped). The above is an example of one embodiment. Shape or size, of course, can be smaller or larger, but there is a minimum size so as to capture the entire guts of the contactless portion of the card. An advantage of this method is that it produces a device that

begins with existing manufacturing techniques. The existing manufacturing of smart cards is done at very high speed and quite efficiently. Certain facilities produce a million smart cards a shift. Thus, by adding the additional process steps of claim 31, a novel, secure, and efficiently made design is easily achieved.

The various dependent claims amplify on features of these processes, and for these additional reasons they also should be allowable.

Entry of the amendment, consideration of the claims and the reasons set forth above after FINAL, and in the absence of more pertinent art, a Notice of Allowance is courteously solicited.

Respectfully submitted,

Roland Plottel
PTO 20,707

212 489-7073
Roland Plottel
P.O. Box 293
New York, NY 10185-0293

Certificate under 37 CFR 1.8(a): I hereby certify that this correspondence is being deposited with the United States postal service as first-class mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231 on MAR 0 0 2001

Roland Plottel
PTO 20707